

# Annotated Guide to the PAEMST Rubric for Evidence of Quality Teaching in Mathematics and Science

Curriculum Indicators	Evidence	Some Comments on Individual Indicators
1) Based on national standards, the mathematics/science content being addressed in the sequence is important and accurate.	II B1	The term “instructional sequence” refers to a unit, module, or other series of lessons related to a mathematics/science topic or concept. “National standards” refers to <i>PSSM</i> , <i>NSES</i> , and, <i>Benchmarks</i> . The written portion of the application should identify the content in accordance with the national standard(s) being addressed
2) The mathematics/science content addressed in the instructional sequence is developmentally appropriate for the students in this class.	II B1	Focus on the indicator in the developmental appropriateness of the mathematics/science content for <i>this</i> class, regardless of the grade range national standards may specify. The rating for this indicator should reflect the developmental appropriateness of the content <i>that</i> is addressed, not <i>how</i> it is addressed (in contrast to indicator #3).
3) The instructional sequence, including the featured lesson, is coherent and appropriate for development of the targeted concept.	II B	For this indicator, keep the following question in mind, “How likely is it that this instructional sequence, if well implemented, will help move student thinking forward in the development of the targeted concept?” Focus in this indicator on <i>how</i> the content is addressed in the instructional sequence (in contrast to indicator #2)
4) The instructional sequence provides appropriate learning opportunities for all students.	II B1 Video	Although students may well be at different levels of initial understanding, the instructional sequence has to allow each student to move forward in his/her understanding. Focus in this indicator on the extent to which the instructional sequence provides access for all students to advance their understanding of the targeted concept(s).

<b>Instruction Indicators</b>	<b>Evidence</b>	<b>Some Comments on Individual Indicators</b>
5) The teacher demonstrates an understanding of the mathematics/science content addressed in the featured lesson.	II B1 Video	The teacher's understanding of the content may be revealed in the written application as well as the dialogue with students in the videotape. Note: The rating on this indicator should not be lowered for content "technicalities" that have no impact on the potential for the lesson to advance students' understanding. Especially in primary grades lessons, teachers may appropriately simplify concepts in order to advance students' understanding.
6) The instructional strategies used are safe, appropriate, and effective for the purposes of the lesson and provide access for all students.	II B2 Video	The instructional strategies should move students towards an understanding of the targeted concepts of the lesson in an appropriate and accessible manner.
7) The teacher demonstrates enthusiasm for teaching mathematics/science.	Video	Enthusiasm should be interpreted to mean the teacher's commitment to teaching students to understand important concepts. We are looking for evidence of the teacher's passion for mathematics/science as a discipline and teaching mathematics/science as a vocation. The excitement and appreciation the applicant shows for students' learning of mathematics/science, as opposed to energy and charisma in the classroom, are key elements of enthusiasm as evidence of excellence in teaching.
8) The teacher provides a welcoming and supportive environment in eliciting contributions from all students.	Video	When rating this indicator, attend to the overall climate and the extent to which active participation was encouraged/valued. The appropriateness of the pace of the lesson, in terms of allowing for students to participate, should be judged within this indicator. The quality of the participation is addressed in indicator #9.
9) The students are intellectually engaged with important mathematical/scientific ideas.	Video	"Intellectual engagement" goes beyond simply doing the task to being involved in thinking about the mathematics/science content of the tasks. A rating of 3 should be made only if most students were deeply engaged in thinking about the content.
10) The teacher's communication skills and questioning strategies are likely to engage student thinking and enhance the development of student conceptual understanding/problem solving.	Video	In rating questioning strategies, attend to whether the teacher's questions encourage thinking and intellectual rigor, and the extent to which the teacher probes for student reasoning and misconceptions. The teacher's use of "wait time" in questioning should be judged within this indicator. Key questions to guide the rating are "Is the questioning likely to help develop the conceptual understanding of students and move their thinking forward?" and "Does the questioning help the teacher understand student conceptions?"

<b>Assessment Indicators</b>	<b>Evidence</b>	<b>Some Comments on Individual Indicators</b>
11) The teacher demonstrates an awareness of students' understanding of the targeted concept(s) in planning and implementing the lesson.	II B1 II B3 II B4 Video	The teacher should take into account students' prior knowledge and experiences with the targeted concept(s) while planning the lesson. Also consider the extent to which the teacher was able to "read" the students' level of understanding during the lesson and adjust accordingly, e.g. types or levels of questions directed to particular students.
12) The teacher effectively uses multiple assessment methods and systematically gathers data about student understanding.	II B1 II B4 Video	In order for this indicator to be highly rated, the assessment plan should provide the students with multiple opportunities to demonstrate fully their understanding of the targeted concept(s) and should have a way to determine the extent of understanding of each student.
13) The teacher's comments on the student work sample demonstrate an awareness of the extent of student understanding exhibited by that student or small group.	III	The teacher should recognize strengths and weaknesses in the student work sample in relation to what would constitute mastery of the targeted concept(s). The teacher's comments should judge the degree of understanding of key ideas related to the targeted concept(s) the student work addresses.

<b>Reflective Practitioner Indicators</b>	<b>Evidence</b>	<b>Some Comments on Individual Indicators</b>
14) The teacher's reflections demonstrate an awareness of the extent of student understanding developed in the lesson.	II B3 II B4	The teacher's reflection should answer the question "How did this lesson help move student thinking forward in the development of the targeted concept?" Examples from the lesson should be cited to illustrate how the lesson developed students' understanding.
15) The teacher has a good understanding of the strengths and weaknesses of the instruction in the featured lesson.	II B3	The teacher should not only identify strengths and weaknesses of the lesson, but should also provide his/her reasoning linked to students' intellectual engagement and/or knowledge of good pedagogy.
16) The planned revisions to the featured lesson are likely to retain the key strengths and improve the weaknesses.	II B3	The planned revisions should contribute to the potential of the lesson to develop student understanding of this targeted mathematics/science concept(s).

<b>Professional and Leadership Indicators</b>	<b>Evidence</b>	<b>Some Comments on Individual Indicators</b>
17) The teacher possesses a strong academic background in mathematics/science appropriate to the grade level taught.	IV A	
18) Participation in workshops, courses and other educational opportunities concerning both content and pedagogy specific to mathematics/science has occurred during the past five years.	IV A IV C	
19) The teacher is engaged in planning, developing, and delivering activities at the building, local, or state level, which affect the mathematics/science teaching strategies of his/her colleagues.	IV D	
20) The teacher is professionally active.	IV	